United Nations A/72/393

General Assembly

Distr.: General
15 September 2017

Original: English

Seventy-second session
Agenda item 136
Proposed programme budget for the biennium 2018-2019

Strategic capital review

Report of the Secretary-General*

Summary

The present report is submitted pursuant to section VI of General Assembly resolution 70/248 B on the strategic capital review, a global capital programme of the United Nations Secretariat related to buildings and infrastructure assets.

The present report provides an update on the cost-benefit analysis and an expanded study of the non-quantifiable benefits of the overall proposed capital maintenance approach for building and infrastructure assets owned by the United Nations, in response to the guidance received from the General Assembly in its resolution 70/248 B. It is estimated that the Organization could save between 34 and 54 per cent of its total capital costs over the life of its buildings by employing the proposed incremental recapitalization methodology. The report also provides an update on the governance structures of the ongoing and proposed projects, including the role of the Office of Central Support Services in providing oversight with an emphasis on risk management and the use of contingency funding.

The report includes an update on the near-term proposed capital projects, outlined by the Secretary-General in his reports to the sixty-ninth and seventieth sessions (A/69/760 and A/70/697), encompassing projects at the United Nations Office at Nairobi, the Economic Commission for Africa, the Economic and Social Commission for Asia and the Pacific and the Economic Commission for Latin America and the Caribbean. The report also includes information on other considerations, including accessibility and the rights of persons with disabilities, sustainability, global long-term accommodation requirements, flexible workplace strategies and alternative financing options.

In the light of section II of resolution 69/274 A, in which the General Assembly emphasized that any potential proposals with budget implications should follow the procedure set out in the Financial Regulations and Rules of the United Nations, and bearing in mind that the strategic capital review is intended to serve as a planning tool for the General Assembly, the Assembly is requested to take note of the present report.

* The present report was submitted on 15 September 2017 to reflect the latest expenditure projections of the capital projects.

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I. Introduction

1. The present report is submitted pursuant to section VI of General Assembly resolution 70/248 B, in which the Assembly endorsed the conclusions and recommendations contained in the report of the Advisory Committee on Administrative and Budgetary Questions (A/70/7/Add.43). The Assembly requested that the Secretary-General continue to provide information on the prioritization of projects proposed under the strategic capital review and to provide more information on the potential costs and benefits of a preventive maintenance programme, as compared with the existing reactive approach, including by examining the various methods previously presented and comparing them with similar strategies followed by other public entities. The Assembly also requested that criteria be established to determine whether construction projects should be submitted under section 33 of the programme budget or as stand-alone proposals and that criteria be established to determine risk categories.

2. In addition, the General Assembly requested more information on the non-quantifiable benefits of the proposed preventive maintenance approach, the impact of flexible workplace strategies and the possible impact of Umoja and the global service delivery model, and the development of project governance structures, in accordance with the guidelines for the management of construction projects.

3. The General Assembly also continued to emphasize the importance of eliminating physical, communication and technical barriers for persons with disabilities.

4. In his previous report (A/70/697), the Secretary-General presented the findings and conclusions of the initial review, including the 20-year capital maintenance programme, which projects a sequence of capital improvement activities over a 20-year period from 2018 to 2037. The initial review was conducted in accordance with established key objectives, which have remained unchanged since the first report of the Secretary-General on the review (A/68/733). The key objectives are: to provide safe and healthy working environments for delegates, visitors and staff over the long term; to comply with the Convention on the Rights of Persons with Disabilities; to maintain property value, maximize space usage efficiency in existing spaces, modernize building systems and move towards more energy-efficient facilities; and to preserve heritage assets and minimize work disruption during capital improvement projects.

5. The purpose of the present report is to provide updated information on the ongoing development and refinement of the general approach to establishing the requirements of the capital programme, as well as on the current status of several proposed and ongoing projects. In particular, the report provides updated information on the cost-benefit comparison of the various industry-standard approaches to capital maintenance, which have been further studied during the present reporting period, in an effort to increase accuracy by expanding the previous methodology to use a much larger set of buildings as case studies. In the present report, the study has been strengthened and expanded to examine a total of four approaches, as opposed to two approaches in the previous report.

6. The report also provides the additional information requested by the General Assembly in its resolution 70/248 B, as indicated in paragraphs 1 to 3 above.

7. With respect to the general disposition of the present report, as the initial capital review was performed only three years ago, the present report does not include a comprehensive update of the 20-year capital maintenance programme (see

A/69/760), rather, its focus is on providing updated information on the requirements of several near-term ongoing and proposed capital projects. Accordingly, the report is intended to serve as a centralized compendium of the multiple reports of the Secretary-General presented during the seventy-second session of the General Assembly, in order to provide Member States with a comprehensive overview of all capital project requirements at Headquarters, offices away from Headquarters, regional commissions and tribunals, and to inform decision-making when considering the individual reports on those projects.

8. During the reporting period, the participating duty stations (including offices away from Headquarters and regional commissions) did not perform additional comprehensive existing conditions surveys. This is in accordance with the practices established under the strategic capital review and the previous report of the Secretary-General, which stipulated that such surveys would be performed every five years, and is also in line with industry best practice.

II. Cost-benefit analysis of the proposed capital maintenance approach

9. In response to the request of the General Assembly to base the cost-benefit analysis on reliable, accurate data and then carry out a comparison with industry standards, including those most commonly applied in the public sector, the specialist cost-estimation consultancy firm that had conducted the previous study was re-engaged to update it. Two general approaches had been examined in the two previous reports of the Secretary-General (see A/69/760 and A/70/697): (a) incremental recapitalization, or the proactive approach, which aims to gradually and systematically perform capital improvements over the life of a building, in an attempt to avoid what would otherwise be larger-scale and higher-risk projects; and (b) run-to-failure, or the reactive approach, which aims to replace whole buildings or building components only after they fail or reach the end of their useful lives.

10. During the reporting period, four options were evaluated, which were raised by the Board of Auditors in a paper on lessons from the capital master plan, published in December 2014, and are also in line with industry best practice. These are:

(a) Run-to-failure;

(b) Replacement at end of useful life (planned maintenance);

(c) Incremental recapitalization to extend useful life (predictive or condition-based maintenance);

(d) Business-focused maintenance (a combination of the second and third options above), which includes:

(i) A controlled maintenance programme;

(ii) A scheduled evaluation of asset conditions;

(iii) A monitoring system.

11. As observed by the Advisory Committee in paragraph 27 of its previous report (A/70/7/Add.43), the Organization has established a section of the programme budget, section 33, devoted entirely to capital improvements. Accordingly, the definitions in the present report have been refined to express a greater degree of accuracy. In the present report, the term "run-to-failure" has been refined to mean the practice of not recapitalizing an asset at all until it fails. The expression

"replacement at end of useful life" is therefore used in the present report to more accurately describe the de facto practice of the Organization to date.

12. The "replacement at end of useful life" approach can be seen in the capital master plan in New York, the strategic heritage plan in Geneva and the renovation of Africa Hall in Addis Ababa. Although it is noted that none of the three projects entails the complete replacement of buildings, the majority of the building components are to be replaced in each case at a significant cost; hence, the term "replacement" is used.

13. As the Secretary-General has indicated in his previous reports on the strategic capital review, a gradual, incremental approach to capital maintenance can ultimately result in significant cost avoidance for Member States and yield many additional non-quantifiable benefits. The present section contains a description of each of the four approaches studied during the reporting period.

A. Definition of the various life-cycle asset management strategies

1. Run-to-failure

14. Under the run-to-failure approach, it is assumed that all assets will fail before the end of their life if they are not maintained on a regular basis. This definition is in line with that used by the Board of Auditors in its paper on lessons from the capital master plan. For the purposes of the cost analysis, it was assumed that assets will fail at 50 per cent of their useful life if not maintained at all.

15. The potential benefit of the approach is that no maintenance costs accrue.

16. The potential drawbacks of the approach are as follows:

(a) Replacement costs at the time when a building asset (plant, machinery and the building fabric) fails and needs to be fixed;

(b) Significant potential capital costs and other risks associated with:

(i) Failure of an asset resulting in failure of the system associated with the asset;

(ii) Downtime due to the delay between ordering and receiving delivery of the replacement asset and other assets that require replacement owing to the failed asset;

(iii) Potential need to relocate staff to a temporary facility;

(iv) Cost to outfit a temporary facility;

(v) Cost to rent or lease a temporary facility;

(vi) Temporary utilities or protection required to maintain other assets;

(vii) Premium cost associated with the emergency replacement of the asset;

(viii) Impossibility of planning a budget for catastrophic failure.

2. Replacement at end of useful life

17. Under the "replacement at end of useful life" approach, it is assumed that an asset can be expected to last the full length of its warranted useful life without risk of catastrophic failure through maintenance of the asset (plant, equipment and building fabric) following a prescribed plan. For the purposes of the cost analysis, it was assumed that all assets would be replaced at the end of their useful life even if they were still in service. Moreover, it was assumed that regularly scheduled

operational maintenance, that is, regular maintenance that did not increase property value or extend the useful life of an asset, would be performed with a view to ensuring warranty compliance and the observance of best practices.

18. The potential benefits of the approach are as follows:

(a) Assets under warranty will be replaced at no cost to the end user if they fail within the warranty period;

(b) There is less risk that the asset will fail within its anticipated useful life;

(c) When the asset is replaced at the end of its useful life, the end user can remain confident in the continued reliability of the system;

(d) Major capital investment is more predictable;

(e) Maintenance costs are more predictable;

(f) New technology replaces old technology at the end of the asset's useful life.

19. The potential drawbacks of the approach are as follows:

(a) Major capital investment is required at the end of the asset's useful life;

(b) Operational costs may increase owing to the need to invest in the maintenance programme, retrain maintenance staff or make capital investments in an instrumentation and control system.

3. Incremental recapitalization to extend useful life

20. Under the "incremental recapitalization to extend useful life" approach, it is assumed that the life of an asset can be extended beyond its a warranted useful life by regularly performing scheduled maintenance in line with warranty requirements and best practices and refurbishing major components of the asset at a reasonably early stage in the expected useful life of the asset, well before catastrophic failure. Under the methodology, it is assumed that major components will be refurbished half way through their individual useful life, as outlined by the Secretary-General in a previous report on the strategic capital review (A/69/760, figure 4). For the cost analysis, it was assumed that this approach would extend the useful life of building assets by 50 per cent.

21. The potential benefits of the approach are as follows:

(a) Capital investment in asset replacement can be deferred beyond the warranty period;

(b) There is a reduced life-cycle cost when the asset cost is amortized over a longer lifespan.

22. The potential drawbacks of the approach are as follows:

(a) Reliance on an established maintenance programme, including training of staff and investment in an instrumentation and control system;

(b) Need for capital investment in the replacement of the major components of assets to extend their useful lives.

4. Business-focused maintenance

23. Business-focused maintenance is a combination of the second (replacement at end of useful life) and third (incremental recapitalization to extend useful life) strategies described above, with an additional focus on monitoring and controlling mechanical assets, staff retraining and the establishment of a closely managed and

monitored maintenance plan.[1] A business-focused maintenance plan establishes the following:

(a) A controlled maintenance programme, which requires investment in:

(i) Retraining for maintenance staff;

(ii) Strengthened monitoring and control;

(b) A scheduled evaluation of asset conditions, which requires the implementation of a recording plan for monitoring the condition and performance of an asset;

(c) A monitoring system, which requires the implementation of an instrumentation and control system. Under such a system, monitoring and control points are added to each asset or piece of operating equipment within a facility. The points are connected to equipment in a control room that monitors the performance of the assets and provides the capability to control them remotely. The monitoring of equipment allows for real-time evaluation of performance and provides an early warning in the case of reduced performance or pending failure of the asset. Real-time monitoring provides operators and end users with sufficient warning to repair or replace assets before catastrophic failure. Instrumentation and control technology has an initial capital cost of 10 per cent or more of the cost of the asset (equipment and installation cost).

24. The potential benefits of the approach are as follows:

(a) Constant monitoring will prevent catastrophic failure of the asset;

(b) The asset can be tuned to perform in the most efficient manner, thereby saving the end user significant operational costs over its lifespan;

(c) Remote control and monitoring are more efficient than localized asset monitoring, thereby saving on maintenance costs;

(d) Better asset control means lower costs over the life of the asset.

25. The potential drawback of the approach is the high initial capital cost for equipment and staff training.

B. Cost analysis methodology

26. Included in this methodology are all building assets in Addis Ababa, Bangkok, Geneva, Nairobi, New York and Santiago.

27. The evaluation method examines 10 components of each building asset, namely (a) foundations, (b) superstructure, (c) exterior closures, (d) roofing, (e) interior, (f) conveying systems, (g) plumbing, (h) heating, ventilation and air conditioning, (i) fire protection, and (j) electrical systems, in line with United Nations International Public Sector Accounting (IPSAS) standards.

28. For asset evaluation purposes, building construction costs were converted from the local currencies of the duty stations into United States dollars (as of July 2017). The evaluation of the building assets at United Nations Headquarters was also updated to reflect their value as of July 2017. On the basis of those figures, the percentage allocation of costs was determined for each of the 10 components. The information obtained was evaluated and compared against the four options listed in

[1] In its paper on lessons from the capital master plan, the Board of Auditors defined "business-focused maintenance" as a combination of the "run to fail", "planned" and "predictive or condition-based maintenance" strategies.

paragraph 10, with the useful lives of assets and components taken from the United Nations IPSAS standards. The evaluation period was 50 years.

(a) **Run-to-failure**. It is assumed that all assets will be neglected and fail at 50 per cent of their useful life. Upon comparison, the costs associated with the run-to-failure option were more than double those under the incremental recapitalization option. In view of this, run-to-failure is not considered a viable option and will not be described in further detail in the present report;

(b) **Replacement at end of useful life**. It is assumed that only operational maintenance will be used to keep components functional. The remaining components are assumed to be fully replaced at the end of their useful life. For example, a component with a useful life of 20 years would be replaced two and a half times over the 50-year useful life of a building (the evaluation period). In addition, an allowance is assumed to cover the costs associated with swing space and temporary protection owing to the need for complete building replacement;

(c) **Incremental recapitalization to extend useful life**. It is assumed that spending comparatively more on capital improvements at the midpoint of the useful lives of individual components will extend asset life by 50 per cent. Under this option, it is assumed that the foundation and superstructure of buildings could be reused with minimal recapitalization;

(d) **Business-focused maintenance**. This option was not costed as an option in this exercise since a standard or systematic methodology cannot be applied to business needs over a 50-year period. This option would result in a unique approach tailored for specific business needs and, as such, its costs could not be compared on an equal basis with the other three options.

C. Summary outcome of the analysis

29. A summary of the comparison of the "replacement at end of useful life" and the "incremental recapitalization" options is shown in table 1. Beginning with the gross replacement cost of the buildings and infrastructure assets at the United Nations Office at Geneva, the United Nations Office at Nairobi, the Economic Commission for Africa (ECA), the Economic and Social Commission for Asia and the Pacific (ESCAP), the Economic Commission for Latin America and the Caribbean (ECLAC) and Headquarters, projected total capital improvement requirements over a 50-year period were calculated using the methodology described in section II.B above. A range of spending for the incremental recapitalization option was used, from low to high, given that an exact projection would be difficult to estimate.

30. According to the analysis, the incremental recapitalization option is the most cost-effective and otherwise beneficial option. The Organization could expect to spend between 34 and 54 per cent less over the 50-year useful life of a building by choosing this option, as opposed to the "replacement at end of useful life" option, which corresponds to the current approach. Although the methodology has been strengthened and the number of buildings included as case studies has been expanded significantly during the reporting period, the present study corroborates the initial findings of the previous study.

Table 1
Fifty-year projections using the "incremental capitalization" and "replacement at end of useful life" approaches by duty station
(Millions of United States dollars (as of 2017))

		Incremental recapitalization			*Replacement at end of useful life*	*Difference*		*Difference (percentage)*	
Location	*Asset value*	*Low end*	*Methodology outcome*	*High end*	*Methodology outcome*	*Low end*	*High end*	*Low end*	*High end*
Addis Ababa	324.9	270	280.7	310	411.8	141.8	101.8	33	53
Bangkok	142.9	120	122.3	130	208.5	88.5	78.5	60	74
Geneva	1 117.6	970	1 022.8	1 130	1 470.9	500.9	340.9	30	52
Nairobi	129.5	100	100.8	110	151.3	51.3	41.3	38	51
New York	1 949.7	1 770	1 858.5	2 040	2 717.4	947.4	677.4	33	54
Santiago	69.7	50	56.8	60	91.5	41.5	31.5	72	83
Total	**3 734.2**	**3 280**	**3 441.9**	**3 780**	**5 051.5**	**1 771**	**1 271**	**34**	**54**

D. Non-quantifiable benefits of the various methodologies

31. First and foremost, proactive stewardship of owned buildings and infrastructure assets is considered a fundamental responsibility of the Organization. The manner in which the Organization cares for its buildings, where delegates, staff and visitors conduct their daily activities, is a reflection of the value the institution places on itself, which can, in turn, heavily influence how others value it.

32. In addition, the manner in which the buildings function and are used is an outward reflection of the broader objectives of the Organization, including the design and use of facilities based on the specific substantive functions of the offices that they house. For example, United Nations buildings should serve as best practice examples of sustainable and green design and of accessibility for persons with disabilities.

33. One of the objectives of the strategic capital review is to provide a safe and healthy work environment for all delegates, staff and visitors. Healthy indoor environments can have strong positive effects on the well-being and productivity of occupants, especially with respect to the amount and quality of light, the use of colour, access to outdoor views, connection to nature and personal control over environmental conditions. Maintaining buildings adequately can have a positive impact on well-being, stress reduction, productivity, work effectiveness, job satisfaction and commitment to the Organization.

34. More broadly, the manner in which United Nations buildings are designed, used and maintained is symbolic of its objectives and should take into account, for example, the Sustainable Development Goals, the 2030 Agenda for Sustainable Development and the Paris Agreement.

35. The key objectives outlined in the first report of the Secretary-General on the strategic capital review (A/68/733) can be viewed in part as the internal implementation of the Organization's outward global goals, including the Sustainable Development Goals. Figure I shows the intersection of the objectives of the strategic capital review with the applicable Sustainable Development Goals.

Figure I
Objectives of the strategic capital review and applicable Sustainable Development Goals

Objectives of the strategic capital review	Sustainable Development Goals: Goal 3. Ensure healthy lives and promote well-being for all at all ages	Goal 6. Ensure availability and sustainable management of water and sanitation for all	Goal 7. Ensure access to affordable, reliable, sustainable and modern energy for all	Goal 9. Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation	Goal 10. Reduce inequality within and among countries	Goal 11. Make cities and human settlements inclusive, safe, resilient and sustainable	Goal 12. Ensure sustainable consumption and production patterns	Goal 15. Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss
To meet industry norms related to health and safety issues	x							
To maintain the property value of United Nations premises				x				
To meet industry norms relative to facilities preparedness and design against potential natural disasters and emergency situations				x		x		
To ensure compliance with all relevant regulations relating to persons with disabilities	x				x			
To ensure that hazardous materials are removed from facilities	x			x				
To improve space usage efficiency by maximizing the use of available office and meeting space							x	
To modernize outdated major building systems, in order to meet industry norms			x	x				
To move towards more energy efficient facilities and improving atmospheric and indoor air quality		x	x	x			x	x
To preserve and, if necessary, restore heritage-specific issues								
To keep disruption of the work of the United Nations to a minimum and to ensure business and operational continuity				x				

V. Recommended approach

36. On the basis of the quantitative analysis described in the present report, as well as a study of the non-quantifiable benefits, the Secretary-General recommends that the Organization adopt an incremental recapitalization approach to capital spending. Accordingly, and subject to additional guidance received from Member States with respect to the contents of the present report, the Secretary-General intends to submit a report on strengthening capital maintenance for the first resumed part of the seventy-second session of the General Assembly.

III. Real estate planning and management

A. Criteria for categorizing projects

37. The Secretariat has established criteria for determining which projects should be submitted to the General Assembly as stand-alone proposals and which are smaller projects that have traditionally been included under section 33 of the programme budget as alteration, improvement and major maintenance activities.

38. As indicated in the report of the Advisory Committee (A/70/7/Add.43), the factors taken into consideration for projects that have been submitted as stand-alone proposals in recent budget periods are size, cost, duration, complexity, type of construction, level of oversight required and risk associated with the projects, as summarized in table 1 of that report. These projects are:

Approved and ongoing projects

- The strategic heritage plan of the United Nations Office at Geneva
- The renovation of Africa Hall at ECA
- The seismic retrofit and life-cycle replacement of the secretariat building at ESCAP

Proposed projects

- The replacement of office blocks A to J at the United Nations Office at Nairobi
- The renovation of the north building at ECLAC

39. The Secretariat has established the criteria for determining the classification of projects into one of three categories: (a) large-scale, (b) large and complex, and (c) largest and most complex. The criteria take into consideration factors such as size, cost, duration, complexity, level of oversight required, type of construction and need for an advisory board. Such categorization informs how the project will be governed and managed, including both internal and external mechanisms.

40. It should be noted, however, that the defined criteria should be used mainly as guidance and that the categories tend to overlap.

41. At the present time, the strategic heritage plan of the United Nations Office at Geneva is defined as the largest and most complex project, while the Africa Hall renovation at ECA and the seismic retrofit and life-cycle renovation of the Secretariat building at ESCAP are considered large and complex projects. If approved by the General Assembly, the replacement of office blocks A to J at the United Nations Office at Nairobi would be considered large and complex, while the renovation of the north building at ECLAC would be considered large.

Table 2
Factors taken into consideration for capital projects to be categorized as (i) large-scale, (ii) large and complex or (iii) largest and most complex

Project size	*Large-scale*	*Large and complex*	*Largest and most complex*
Size	Usually less than 10,000 m² affecting a large area of the premises or multiple buildings	Usually between 10,000 and 50,000 m², affecting a large area of the premises or multiple buildings	Usually more than 50,000 m², affecting a large area of the premises or multiple buildings
Costs	$10 million to $25 million	$25 million to $100 million	More than $100 million
Duration	2 to 5 years	2 to 7 years	More than 7 years
Complexity	May not require swing space; entails construction within occupied buildings; multiple subprojects; single phase	Requires moderate swing space; entails construction within occupied buildings; multiple subprojects; multiple phases	Requires extensive swing space; entails construction within occupied buildings; multiple subprojects; multiple phases
Type of construction	Adds new building(s) or significantly alters existing buildings or structures	Adds new building(s) or significantly alters existing buildings or structures	Adds new building(s) or significantly alters existing buildings or structures
Level of oversight required	Requires a large, dedicated United Nations project management team and other oversight mechanisms	Requires a large, dedicated United Nations project management team and other oversight mechanisms	Requires a large, dedicated United Nations project management team and other oversight mechanisms
Risk management	Requires separate contingency provisions to cover risks; requires a third-party risk-management firm; may not require a dedicated coordinator at Headquarters	Requires separate contingency provisions to cover risks; requires a third-party risk-management firm; requires a dedicated coordinator at Headquarters; Monte Carlo risk model	Requires separate contingency provisions to cover risks; requires a third-party risk-management firm; Monte Carlo risk model
Stakeholder engagement (internal governance)	Stakeholders committee	Stakeholders committee	Steering committee
Advisory board (external governance)	Not required	Preferably established	Mandatory

B. Risk management

42. In line with relevant General Assembly resolutions and the recommendations of the Board of Auditors on both the capital master plan in New York and the strategic heritage plan in Geneva and as indicated in the guidelines for the management of global construction projects, emphasis should be given to risk management when executing United Nations construction projects. In addition, the Assembly has mandated the Office of Central Support Services to perform oversight, with emphasis on risk management and alignment with lessons learned,

to ensure central supervision of capital projects (see resolution 71/272 A, sect. IV, para. 14, and sect. V, para. 14).

43. The purpose of the independent risk-management services of the Office of Central Support Services is to identify and assess any uncertainties relating to the project and, thus, define optimal risk responses that assure the successful delivery of project-specific objectives, as well as related programme and operational objectives of the United Nations. The Office will establish a controlled risk-management framework and develop and implement a risk-management strategy that includes mechanisms and procedures for determining and managing risk-contingency funding tailored to the project's nature, circumstances and requirements.

44. The services to be provided aim for decision makers to: (a) have increased confidence in achieving the desired objectives, outputs, outcomes and benefits; (b) effectively mitigate and constrain threats to acceptable levels; (c) take informed decisions about exploiting opportunities; and (d) have increased confidence in the mechanisms, procedures and controls to access the risk-contingency budget.

45. The following is a summary of the scope of the independent risk-management services to be provided for each United Nations construction project:

(a) Establishing and maintaining a disciplined risk-management framework that specifies the roles and responsibilities of the stakeholders with regard to risk-management actions and defines the environment for implementing an effective risk-management strategy, including the risk-contingency budget;

(b) Coordinating with key stakeholders to fully understand the organizational and project-specific objectives that are at risk, determine the risk appetite associated with each project and identify those opportunities and threats that might have an impact on the objectives;

(c) Establishing and maintaining a risk-management strategy for protecting and achieving the specified objectives;

(d) Developing, populating and maintaining a risk register and developing, monitoring and controlling risk-response plans and actions to ensure that risks are properly addressed;

(e) Ensuring that each level of management, including key stakeholders, receives regular assurance about the management of project risks within its span of control;

(f) Providing qualitative and quantitative assessment of identified project risks. In this regard, quantitative risk-evaluation techniques, through the application of the Monte Carlo analysis method, should facilitate a thorough understanding of the main risk drivers by mathematically simulating the likelihood and impact of risks occurring within a given range under a set of theoretical scenarios;

(g) Providing regular progress reports about the status and changes of the project's risk exposure, the contingency funds spent to date and the projected costs to completion.

C. Establishment and management of project contingency provisions

46. The Office of Central Support Services will ensure the professional and systematic application of risk-management procedures, tailored for a project's nature, circumstances and requirements, and make recommendations to the project owner for determining, establishing and managing the risk-contingency budget.

47. These procedures will be applied on a regular basis for any risks identified by stakeholders or the project management team and consider inherent and residual risks at the start of the project, as well as risks that emerge as the project progresses or because of changes or modifications, and for risks relating to possible claims from contractors or suppliers, and for any other risks that become apparent during project execution.

48. The proposals and recommendations of the Office regarding the risk-contingency budget, the sum of the money set aside from the regular project budget to fund specific management responses to identified project risks, considering both opportunities and threats, will be based on the analysis of each risk by estimating the likelihood that it will occur (probability), evaluating its possible impact costs and calculating the costs for management responses.

49. The total sum of all the individual management response costs weighted by the likelihood that the risk will occur will then result in the total monetary value needed for risk response actions. This monetary value will form the basis on which the risk-contingency budget is developed. The fully developed risk-contingency budget should cover response actions during the whole life of the project and consider provisions for known (identified and assessed) and unknown (not yet identified) risks, which are yet to be discovered as the project progresses. In this regard, the Office will endeavour not to skew the risk-contingency budget by including risks with a high impact but a very low probability. The Monte Carlo analysis or other analytical risk-evaluation techniques will be applied for more accurate estimation of the risk-contingency budget.

50. The Office will also propose mechanisms, procedures and controls for accessing the risk-contingency budget.

D. Respective roles and responsibilities within the project governance structure

51. All projects under the strategic capital review are aligned with the generic governance structure (see A/70/697), and project-specific arrangements are or will be tailored on a case-by-case basis.

52. In line with paragraph 20 of section IV of resolution 71/272 A, the Office of Central Support Services is in the final stages of recruiting a Project Coordinator (P-4), who will be based at Headquarters in New York and report to the Chief of the Overseas Property Management Unit of the Office. In addition, the Office is currently in the process of hiring a specialist risk-management firm to perform independent risk-management services, with emphasis on executing Monte Carlo risk-modelling simulation and to support the Office in providing professional expertise, guidance and advice in managing project risks and to create professional risk-management products throughout the core stages of the project life cycle. At the time of reporting, contract negotiations were at an advanced stage and the signing of contracts was expected imminently.

53. Contract management, as well as coordination of the efforts between the specialist risk-management firm and the local project teams at ECA and ESCAP and other key stakeholders, will be performed by the Project Coordinator (P-4).

IV. Updated capital maintenance programme

54. In 2017, feasibility studies were successfully completed for two of the projects for which resources were included under section 33 of the programme budget for the biennium 2016-2017: the replacement of office blocks A to J at the United Nations Office at Nairobi and the renovation of the north building at ECLAC. The results of those studies will be reported in detail to the General Assembly in separate reports on those projects at the main part of the seventy-second session.

Updated list of near-term capital projects

55. An updated list of ongoing approved, proposed and projected near-term capital projects is reflected in figure II. For general reference, the requirements for the biennium 2016-2017 have been included. In addition, the requirements for the flexible workplace strategy in New York have been included in accordance with section XVI, paragraph 17, of General Assembly resolution 71/272 A.

56. In line with resolution 69/274 A, in which the General Assembly emphasized that the development of a long-term capital programme should include within its scope a prioritization strategy, the projects initially proposed were prioritized in accordance with needs-based assessments. The priority of the projects included in the previous report (A/70/697) remains largely unchanged, although several projects that were initially planned to commence in the biennium 2018-2019 (namely, those listed under section 4, anticipated near-term capital projects, in figure II) have been deferred to start no sooner than the biennium 2020-2021, owing to resource constraints or the fact that feasibility studies conducted in the biennium 2016-2017 yielded inconclusive results to the extent that projects could not begin as originally envisaged.

Figure II

Sequencing of near-term capital projects and other construction works (projected timeline and capital requirements for the period 2016-2027)

(Millions of United States dollars)

Project	Requirements	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
1. Approved and ongoing capital projects													
United Nations Office at Geneva - strategic heritage plan (appropriation)[a]	392.9	32.6	10.5	33.8	52.5	95.8	59.6	91.2	16.9				
United Nations Office at Geneva - strategic heritage plan (Loan from the Government of Switzerland)[a]	400.1		37.7	58.4	54.4	95.8	59.6	91.2	3				
Economic and Social Commission for Asia and the Pacific - seismic mitigation project	40.4	0.38	0.75	4.11	8.79	7.72	13.2	5.2	0.23				
Economic Commission for Africa - Africa Hall renovation	56.8	3.1	2	14.07	15.2	17.4	5.03						
Estimated total cost for approved capital projects	490.1	36.08	13.25	51.98	76.49	120.92	77.83	96.4	17.13				
2. Long-term accommodation needs													
Headquarters - flexible workplace strategies	53.1	5.95	10.47	13.73	13.37	9.53							
Headquarters - long-term accommodation needs													
Estimated cost	To be determined												
3. Projects proposed in the 2018-2019 budget period													
United Nations Office at Nairobi - blocks A to J													
Estimated cost	70.0		0.55	0.6	2.5	6.8	29.0	9.5	20.2	1.3			
Economic Commission for Latin America and the Caribbean -- north building													
Estimated cost	14.1		0.06	0.2	0.6	0.4	6.2	6.5	0.3				
4. Anticipated near-term capital projects													
Economic Commission for Africa -- old office building													
Estimated cost	13.7					3.1		5.3		5.3			
United Nations Office at Nairobi -- site infrastructure													
Estimated cost	18.8					3.1		4.2		5.4		6.1	
Economic Commission for Africa -- cafeteria and library													
Estimated cost	12.0					2.3		4.7		2.5		2.5	
Estimated total cost for anticipated capital projects (3+4)			0.61		3.9		50.86		50.69		14.48		8.60
5. Ongoing construction, alteration, improvement and major maintenance projects (sect. 33 of the programme budget)													
Estimated total for requirements under section 33[b]			33.4		29.9		29.9		29.9		29.9		29.9
Estimated total cost for capital projects and requirements under section 33			**99.8**		**189.3**		**289.0**		**194.1**		**44.4**		**38.5**

Legend:

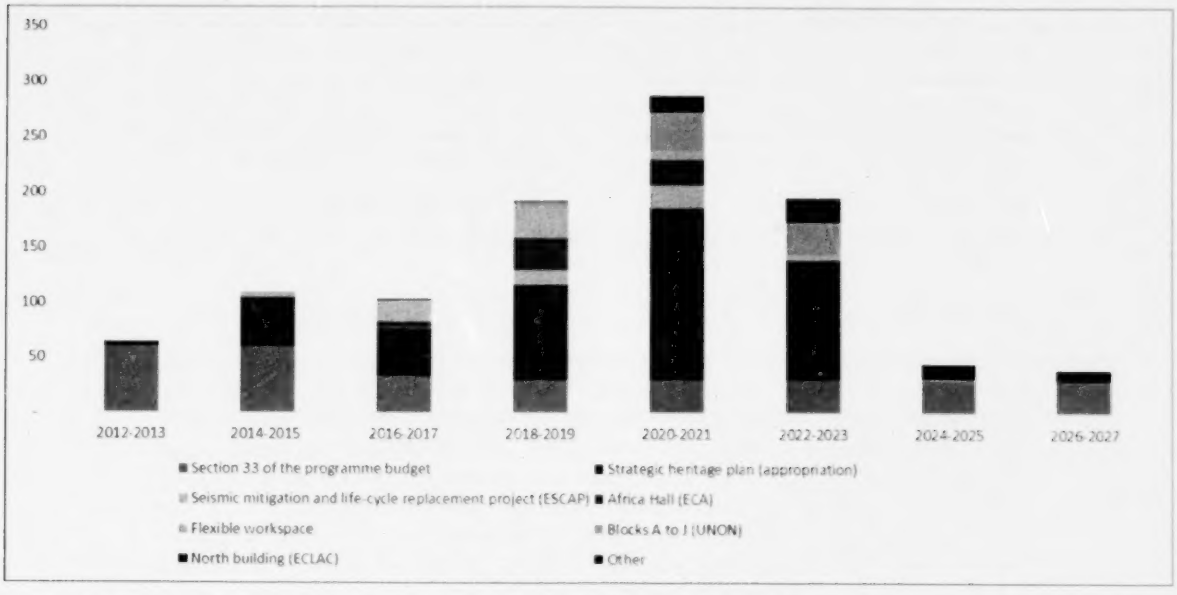
- Planning and design phases
- Construction phase
- Implementation phase of projects not yet approved
- Planning phases of projects not yet approved

[a] Requirements for the strategic heritage plan are indicated in Swiss francs.

[b] Amounts under section 33 for Headquarters reflect facilities-related requirements only and exclude resources for information and communications technology infrastructure and enterprise network and security. For the purposes of the present report only, requirements under section 33 are assumed to remain at proposed 2018-2019 levels in future bienniums, until the General Assembly has considered the forthcoming report of the Secretary-General on strengthening capital maintenance.

57. Figure III shows the project capital requirements on a per biennium, per project basis.

Figure III
Projected total capital requirements, 2018-2027
(Millions of United States dollars)



Note: Data for 2012-2013, 2014-2015 and 2016-2017 are included for reference purposes.
Abbreviations: ECA, Economic Commission for Africa; ECLAC, Economic Commission for Latin America and the Caribbean; ESCAP, Economic and Social Commission for Asia and the Pacific; UNON, United Nations Office at Nairobi.

Strategic heritage plan of the United Nations Office at Geneva

58. The Secretary-General will submit his fourth annual progress report on the strategic heritage plan at the main part of the seventy-second session of the General Assembly. For general reference and planning purposes, the resource requirements included in the present report on the strategic capital review are indicative of the second financing option, which entails use of the loan of 400 million Swiss francs provided by the Government of Switzerland and appropriation and assessment of the remaining 392 million Swiss francs, assessed on an annual basis according to projected expenditures. Since the General Assembly has not yet approved the scheme of appropriation and assessment for the project, future reports on the strategic capital review will include updated information on the basis of the decision taken by the Assembly.

59. The present report also assumes loan repayment requirements after 2023, in accordance with the second option.

Seismic mitigation retrofit and life-cycle replacement project at the Economic and Social Commission for Asia and the Pacific premises in Bangkok

60. In section IV of its resolution 71/272 A, the General Assembly approved the proposal to undertake a seismic mitigation retrofit and life-cycle replacement project to comply with national codes and mitigate health and safety risks for staff and visitors. The project is to be implemented in six phases from 2016 to 2023, comprising: (a) in 2016, pre-planning activities, including an inspection, a

feasibility study and the preparation of a business case (completed); (b) from 2017, planning, including the establishment of a project team, development of a project programme, architectural requirements and project governance; (c) development of a detailed structural seismic retrofit and architectural design, specifications and scope of works; (d) development of bidding documents; (e) construction and handover; and (f) project close-out.

61. In the biennium 2016-2017, ESCAP established a stakeholders committee for the project as a key aspect of the overall governance structure, completed the recruitment of the dedicated project management team, sourced the lead architectural consultancy services and independent risk-management consultancy services and verified the initial seismic design. It is currently undertaking a study on space efficiency, energy efficiency and accessibility for persons with disabilities.

62. The Secretary-General will submit his first annual progress report on the seismic mitigation and life-cycle replacement project at the main part of the seventy-second session of the General Assembly.

Africa Hall project at the Economic Commission for Africa in Addis Ababa

63. In its resolution 70/248 B, the General Assembly approved the project scope, schedule and estimated cost in the amount of $56.9 million for the renovation of Africa Hall and the visitors' centre. The main objectives of the renovation project are to: (a) address the inadequacies related to building safety and functionality and to transform Africa Hall into a rejuvenated facility that complies with the highest international standards for conference facilities; (b) preserve and restore the historical and cultural value embedded in its architecture; and (c) include a visitors' centre to make Africa Hall one of the leading tourist destination in Addis Ababa and to highlight its significant role in modern African history.

64. The Africa Hall renovation project comprises five stages, of which the preparation and design stages have been completed. The third stage, pre-construction, is currently under way with the preparation of tender documents by the lead consultant. This will be followed by the construction and project close-out stages.

65. The Secretary-General will submit his annual progress report on the renovation of Africa Hall project at the main part of the seventy-second session of the General Assembly.

Replacement of office blocks A to J at the United Nations Office at Nairobi

66. As indicated in an earlier report on the strategic capital review (A/69/760, para. 34), the Secretary-General recommends the replacement of the prefabricated blocks A to J at the United Nations Office at Nairobi as the blocks were constructed as temporary facilities in 1974 and are now 40 years old, have exceeded their useful life and are in urgent need of replacement. The aim is to create a more modern, flexible and efficient workspace environment to accommodate an increased number of staff on the compound and to comply with all local and international building regulations.

67. In 2016-2017, the Office completed a feasibility study and an initial scope review, including structural, seismic and detailed space usage studies. The findings of the study will be reported in a separate report at the main part of the seventy-second session of the General Assembly.

68. The feasibility study included three possible options for implementing the project. The recommended option entails the construction of a new "right-sized" building to replace blocks A to J, and a comprehensive renovation of the remaining

parts of the complex by employing flexible workplace strategies. This would meet the existing space needs of the Office's occupants and tenants, and would also meet the projected needs of the United Nations specialized agencies, funds and programmes currently housed outside the secure complex of the United Nations Office at Nairobi. The total project cost is estimated at $69.88 million, to be undertaken over seven years, from 2018 to 2024.

69. The projected annual requirements of the recommended option are included in figure II above, under section 3, projects proposed in the 2018-2019 budget period.

North building refurbishment at the Economic Commission for Latin America and the Caribbean

70. As indicated in the previous report, the north building at ECLAC, which was originally conceived as a temporary building, was built in 1989. Given the age of the building and the fact that it was intended to be temporary, maintenance costs are high and remodelling will be costly. The recommended action is, therefore, to execute a complete building refurbishment, retaining the main structure, fireproofing the building and replacing the roof, facade and interior finishes.

71. In the biennium 2016-2017, a feasibility study and an initial scope review were completed, including structural, seismic and detailed space usage studies. The findings of the study will be reported in a stand-alone report at the main part of the seventy-second session of the General Assembly.

72. The feasibility study included two possible options for implementing the project. The recommended option entails the renovation of the north building in one phase, utilizing on-site swing space. The total project cost is estimated at $14.12 million, to be undertaken over six years, from 2018 to 2023.

73. The projected annual requirements of the recommended option are included in figure II above, under section 3, projects proposed in the 2018-2019 budget period.

Ongoing construction, alteration, improvement and major maintenance projects under section 33 of the programme budget

74. The estimated amounts for Headquarters under section 33, construction, alteration, improvement and major maintenance, shown in figures II and III above, reflect facilities-related requirements only and exclude resources for information and communications technology infrastructure and enterprise network and security. For the purposes of the present report only, requirements under section 33 of the programme budget are assumed to remain at the proposed 2018-2019 levels in future bienniums, until the General Assembly has considered the forthcoming report of the Secretary-General on strengthening capital maintenance.

V. Other considerations

A. Accessibility

75. In line with resolution 70/170 on the full realization of an inclusive and accessible United Nations for persons with disabilities and with section V, paragraph 4, of resolution 68/247 B on the strategic capital review, in which the General Assembly emphasized the importance of eliminating physical, communication and technical barriers for persons with disabilities, the present report highlights several initiatives undertaken by the Secretariat to this end within the reporting period.

76. In June 2017, a working group of the Interdepartmental Task Force on Accessibility, chaired by the Facilities Management Service in New York, launched a survey soliciting feedback from the user community at Headquarters regarding the performance of the facilities relating to accessibility. The survey is open to Member State representatives, staff, civil society and the public.

77. The existing facilities meet or exceed the prevailing accessibility requirements of the host country, the Americans with Disabilities Act. However, as indicated in the previous report on the strategic capital review, the intention for ongoing and planned projects is to determine whether it is feasible to exceed those requirements and to apply a set of international best practices, based on specific user needs.

78. Once feedback is received and directed to the relevant office, the Secretariat will determine the course of action to address the requirements. This will include whether requirements can be met through reasonable accommodation, capital investment or other services, and whether they can be met within existing resources or would require additional resources.

79. The practice of soliciting user feedback through the establishment of project working groups is also currently being employed by the United Nations Office at Geneva as part of the strategic heritage plan, by ECA as part of the Africa Hall project and by ESCAP as part of the seismic mitigation project. It is expected that the survey in New York will be adapted and used by other offices as an example of best practice and that the solicitation of targeted user feedback, in addition to being used for capital planning, will become a standard part of ongoing operations in future.

80. With respect to the renovation of Africa Hall, the project team has performed a landmark study that is also expected to be adopted by other offices. The study, which was conducted by the consulting architectural and engineering design firm for the project, with input from an accessibility task force that was established for the project (see A/72/374), compared five prevailing sets of standards for key areas affecting all United Nations facilities with respect to accessibility for persons with mobility-related disabilities.

81. The study compared standards from Australia, the European Union, Singapore, the United Kingdom of Great Britain and Northern Ireland and the United States of America, in areas such as the required slope and width of ramps, the design of door openings and toilet rooms and other key design aspects. The project team compiled a list of the best of these standards, which will be used to determine whether it is feasible for the project at ECA to establish the highest international standard and, furthermore, whether this new standard could also be applied incrementally to future projects.

82. At the time of reporting, the process of pricing various initiatives and determining how they might be financed, for example, through existing resources, donations or other options, was under way. The study has been shared with all offices through the Inter-Agency Network of Facilities Managers.

B. Flexible workplace strategies

83. The Secretary-General will submit a progress report on the implementation of flexible workplace strategies in New York at the main part of the seventy-second session of the General Assembly. The report will highlight progress made since the first annual progress report (A/70/708).

84. In line with section XVI, paragraph 17, of resolution 71/272 A, the flexible workplace strategies project in New York has been included in the present report on

the strategic capital review. The projected annual expenditures for flexible workplace are included in figures II and III.

85. It should be noted that, whereas the business case for a flexible workplace in New York clearly indicates a favourable payback period, the table and figures included in the present report list the capital requirements only, that is, there is no distinction made between the capital outlay and the expected income or return to be generated by or future cost avoidance associated with each project.

86. In addition to the progress made in New York, in accordance with paragraph 19 of the report of the Advisory Committee on Administrative and Budgetary Questions on the construction of a new facility for the International Residual Mechanism for Criminal Tribunals, Arusha branch (A/71/812), endorsed by the General Assembly in its resolution 71/282, the Secretariat has ensured that proposals for construction projects incorporate clear baseline data and flexible workplace elements, wherever possible, from the outset.

87. To this effect, and also in line with the recommendation of the Board of Auditors (A/71/5 (Vol. I), para. 131), in early 2017 the Office of Central Support Services developed a standardized methodology for conducting space utilization studies at all duty stations. The methodology includes set parameters for the type and number of spaces to be surveyed, the duration and frequency of the data acquisition period, a standard report format and a sample data analysis presentation.

88. As per the separate reports issued on the strategic heritage plan in Geneva and the proposed replacement of blocks A to J in Nairobi, the average utilization rate at these locations is approximately 45 per cent, which is the same result found in New York and is, in fact, similar across other organizations in other business sectors. It can therefore be expected that other studies, which are planned or currently under way at ECA and ESCAP, will yield similar results.

89. In line with the objectives of the strategic capital review, which include space usage efficiency, all ongoing or proposed projects included in the review include flexible workplace strategies, wherever possible.

C. Sustainability

90. In response to resolutions 70/205 and 71/228, in which the General Assembly requested the Secretary-General to submit an action plan for the Secretariat that would be designed to work within existing procurement rules and policies aimed at integrating sustainable development practices into its operations and facilities management, building on existing efforts and promoting cost-effectiveness, and in accordance with legislative frameworks, including financial rules and regulations, while maintaining accountability to Member States, with the specific goal of a United Nations that did not, through its operations or facilities management, have a negative impact on the climate, an action plan to establish environmental management systems at Secretariat locations was put forward in a note by the Secretariat (A/71/608).

91. In line with the objectives of the strategic capital review, the capital projects included in the present report include sustainability initiatives. Foremost among them are initiatives to increase efficiency and reduce energy consumption. However, the projects also include other sustainability-related benefits, some of which do not have direct or immediately quantifiable benefits for the Organization. These include the reduction of greenhouse gas emissions, increased water efficiency, improvement of indoor air quality and the removal of hazardous materials.

92. Furthermore, in line with the guidance received from the General Assembly on various projects, the offices undertaking capital projects have ensured that baseline data are collected prior to the implementation of the projects, so that energy and other environmental benefits may be measured accurately (if they are quantifiable) following the implementation of the projects.

D. Impact of the global service delivery model and other business transformation initiatives

93. In line with the recommendation of the Advisory Committee (A/70/7/Add.43, para. 5) that future reports on the strategic capital review include information on the possible impacts of the implementation of Umoja, flexible workplace strategies and the global service delivery model, should they result in significant changes in staffing levels and/or the total number of assigned seats at the duty stations included in the strategic capital review as compared with existing conditions, the Office of Central Support Services continues to monitor these developments.

94. The impact of flexible workplace strategies is addressed above and detailed information is included in the stand-alone reports. At present, the impact of the global service delivery model is not known. In addition, Umoja has no known impacts that would change the project proposals contained in the present report.

95. In the meantime, however, and as indicated in previous reports on the strategic capital review, the Secretary-General considers that it is prudent practice for the management and stewardship of the real estate assets of the Organization to proactively pursue a capital maintenance programme for these assets.

96. It should be noted that none of the construction and renovation projects proposed and summarized in the present report entails the expansion of United Nations facilities. The projects currently entail only the renovation or replacement of existing buildings.

E. Alternative financing options

97. The Secretary-General has been soliciting voluntary contributions from Member States, both in cash and in kind, in the context of the strategic heritage plan, as well as the construction projects at ECA and ESCAP, and intends to continue to do so for the forthcoming projects. Wherever relevant and possible, the use of income received from tenants will also be proposed to Member States, as well as from the valorization of United Nations-owned real estate assets and energy-related subsidies. Those options will be presented in the relevant project reports.

VI. Recommended actions to be taken by the General Assembly

98. **It is recommended that the General Assembly:**

(a) **Take note of the present report;**

(b) **Request the Secretary-General to submit an updated report on the long-term capital maintenance programme (2020-2039) at the main part of the seventy-fourth session.**